

## CLAIMS

What is claimed is:

- 1           1. Circuitry comprising:  
2           a hybrid to combine signals from a pair of antennas and to provide a sum  
3           signal and a difference signal; and  
4           switching circuitry to select between the sum signal and the difference  
5           signal based on a signal quality of the sum and difference signals.
  
- 1           2. The circuitry of claim 1 wherein the hybrid has a first antenna port to  
2           couple with a first of the antennas, a second antenna port to couple with a second  
3           of the antennas, and a first and a second switch port to provide respectively the  
4           sum signal and the difference signal,  
5           wherein a signal path between at least some of the ports is a compressed  
6           signal path having a plurality of 90-degree bends therein to reduce spacing  
7           between the at least some of the ports.
  
- 1           3. The circuitry of claim 1 wherein the hybrid comprises reactive-power  
2           dividers associated with a first antenna port and a first switch port,  
3           wherein the hybrid is to provide substantially a predetermined phase  
4           difference between the first antenna port and the first switch port, and  
5           wherein the reactive power-dividers associated with the first antenna port  
6           and the first switch port are spaced closer than a physical distance associated  
7           with the predetermined phase difference in a stripline medium.
  
- 1           4. The circuitry of claim 3 wherein the signal path between the reactive  
2           power-dividers comprises the plurality of 90-degree bends to reduce a distance  
3           between the reactive power-dividers to less than a distance associated with the  
4           predetermined phase difference.
  
- 1           5. The circuitry of claim 2 wherein the hybrid is a 180-degree compact  
2           hybrid,

3            wherein signal paths between ports of the hybrid comprise stripline,  
4            wherein the sum signal comprises signals from the antennas combined  
5 substantially in-phase, and  
6            wherein the difference signal comprises signals from the antennas  
7 combined substantially out-of-phase.

1            6. The circuitry of claim 1 wherein the switching circuitry further  
2 comprises logic circuitry to compare a packet error rate between the sum and  
3 difference signals and to select one of the signals which has a lower packet error  
4 rate.

1            7. The circuitry of claim 6 further comprising transceiver circuitry to  
2 measure the packet error rate of the sum and difference signals, and to receive  
3 the selected signal from the switching circuitry for subsequent demodulation.

1            8. The circuitry of claim 7 wherein the signals comprise orthogonal  
2 frequency-division multiplexed signals comprising a plurality of orthogonal  
3 symbol-modulated subcarriers in a 5 GHz frequency spectrum.

1            9. The circuitry of claim 7 wherein the signals comprise direct-sequence  
2 spread-spectrum modulated signals in a 2.4 GHz spectrum.

1            10. The circuitry of claim 7 wherein the signals comprise one of either  
2 orthogonal frequency-division multiplexed signals comprising a plurality of  
3 symbol-modulated subcarriers or complementary code keying-modulated signals,  
4 the signals being in a 2.4 GHz frequency spectrum.

1            11. The circuitry of claim 2 wherein the hybrid is to provide substantially  
2 a  $\frac{3}{4}$  wavelength phase difference between the first antenna port and the first  
3 switch port,  
4            wherein the hybrid is to provide substantially a  $\frac{1}{4}$  wavelength phase  
5 difference between the first antenna port and the second switch port,

6            wherein the hybrid is to provide substantially a  $\frac{1}{4}$  wavelength phase  
7 difference between the second antenna port and the second switch port, and  
8            wherein the hybrid is to provide substantially a  $\frac{1}{4}$  wavelength phase  
9 difference between the second antenna port and the first switch port.

1            12. The circuitry of claim 1 wherein the hybrid is a first hybrid to operate  
2 in a first frequency spectrum, and wherein the circuitry further comprises:  
3            a second hybrid to operate in a second frequency spectrum; and  
4            diplexing circuitry to provide signals received through the antennas in the  
5 first frequency spectrum to the first hybrid, and to provide signals received  
6 through the antennas in the second frequency spectrum to the second hybrid.

1            13. The circuitry of claim 12 wherein the diplexing circuitry is first  
2 diplexing circuitry, wherein the circuitry further comprises second diplexing  
3 circuitry, wherein the first hybrid is to provide a first sum signal and a first  
4 difference signal in the first frequency spectrum to the second diplexing  
5 circuitry, wherein the second hybrid is to provide a second sum signal and a  
6 second difference signal in the second frequency spectrum to the second  
7 diplexing circuitry, and  
8            wherein the second diplexing circuitry is to combine the first and second  
9 sum signals and the first and second difference signals to provide to the  
10 switching circuitry a combined sum signal and a combined difference signal, the  
11 combined sum and difference signals comprising frequencies in the first and  
12 second frequency spectrums.

1            14. The circuitry of claim 12 wherein the switching circuitry is first  
2 switching circuitry and wherein the circuitry further comprises second switching  
3 circuitry,  
4            wherein the first hybrid is to provide a first sum signal and a first  
5 difference signal in the first frequency spectrum to the first switching circuitry,  
6 and the second hybrid is to provide a second sum signal and a second difference  
7 signal in the second frequency spectrum to the second switching circuitry, and

8            wherein the second switching circuitry is to select either the second sum  
9            signal or the second difference signal based on a signal quality of the second sum  
10          and difference signals.

1            15. The circuitry of claim 14 wherein the first switching circuitry is to  
2            provide either the sum or the difference signal in the first frequency spectrum to  
3            a first transceiver to process signals from the first frequency spectrum, and  
4            wherein the second switching circuitry is to provide either the sum or the  
5            difference signal in the second frequency spectrum to a second transceiver to  
6            process signals from the second frequency spectrum.

1            16. The circuitry of claim 12 wherein the signals comprise orthogonal  
2            frequency-division multiplexed signals comprising a plurality of symbol-  
3            modulated subcarriers, and  
4            wherein the first frequency spectrum is a 5 GHz frequency spectrum and  
5            the second frequency spectrum is a 2.4 GHz frequency spectrum.

1            17. A method comprising:  
2            generating a sum signal and a difference signal with a hybrid from a pair  
3            of antennas; and  
4            selecting between the sum signal and the difference signal based on a  
5            packet error rate of the signals.

1            18. The method of claim 17 wherein the generating comprises providing  
2            substantially a predetermined phase difference between a first antenna port and a  
3            first switch port of the hybrid, wherein a signal path between reactive power-  
4            dividers associated with the ports comprises a plurality of 90-degree bends to  
5            reduce a distance between the reactive power-dividers to less than a distance  
6            associated with the predetermined phase difference.

1            19. The method of claim 18 further comprising:  
2            measuring the packet error rate of the sum signal and the difference  
3            signal;

4 comparing the measured packet error rates; and  
5 demodulating the selected signal,  
6 wherein the signals comprise orthogonal frequency-division multiplexed  
7 signals comprising a plurality of symbol-modulated subcarriers in a  
8 predetermined frequency spectrum, the predetermined frequency spectrum  
9 comprising either a 5 GHz frequency spectrum or a 2.4 GHz frequency spectrum.

1 20. The method of claim wherein 19 the generating comprises:  
2 generating a first sum signal and a first difference signal in a first  
3 frequency spectrum with a first hybrid from a pair of antennas;  
4 generating a second sum signal and a second difference signal in a second  
5 frequency spectrum with a second hybrid from the pair of antennas; and  
6 separating the signals received through the pair of antennas into signals  
7 of the first and second frequency spectrums prior to generating the sum and  
8 difference signals, and  
9 wherein the selecting comprises selecting between either the first sum  
10 signal and the first difference signal, or the second sum signal and the second  
11 difference signal.

1 21. The method of claim 20 further comprising combining the first and  
2 second sum signals and the first and second difference signals prior to  
3 demodulating.

1 22. A hybrid comprising:  
2 four reactive power-dividers; and  
3 signal paths coupling the reactive power-dividers to provide a  
4 predetermined phase difference therebetween,  
5 wherein the signal paths have a plurality of 90-degree bends therein to  
6 reduce a distance between the coupled reactive power-dividers to less than a  
7 distance associated with the predetermined phase difference.

1           23. The hybrid of claim 22 wherein the hybrid is a 180-degree hybrid  
2     fabricated in either a stripline or microstrip medium and is to combine signals  
3     from a pair of antennas to provide a sum signal and a difference signal,  
4           wherein the hybrid further comprises:  
5           a first antenna port to couple with a first of the antennas;  
6           a second antenna port to couple with a second of the antennas; and  
7           first and second switch ports to provide, respectively, the sum signal and  
8     the difference signal, the sum signal comprising signals from the antennas  
9     combined substantially in-phase, the difference signal comprising signals from  
10    the antennas combined substantially out-of-phase.

1           24. The hybrid of claim 23 wherein the signals comprise orthogonal  
2     frequency-division multiplexed signals comprising a plurality of symbol-  
3     modulated subcarriers in a predetermined frequency spectrum, the predetermined  
4     frequency spectrum comprising either a 5 GHz frequency spectrum or a 2.4 GHz  
5     frequency spectrum,  
6           wherein the hybrid is to provide substantially a  $\frac{3}{4}$  wavelength phase  
7     difference between the first antenna port and the first switch port,  
8           wherein the hybrid is to provide substantially a  $\frac{1}{4}$  wavelength phase  
9     difference between the first antenna port and the second switch port,  
10          wherein the hybrid is to provide substantially a  $\frac{1}{4}$  wavelength phase  
11     difference between the second antenna port and the second switch port, and  
12          wherein the hybrid is to provide substantially a  $\frac{1}{4}$  wavelength phase  
13     difference between the second antenna port and the first switch port.

1           25. A wireless communication device comprising:  
2     a pair of substantially omnidirectional antennas;  
3     a hybrid to receive signals from the pair of antennas and to provide a sum  
4     signal and a difference signal; and  
5     switching circuitry to select between either the sum signal or the  
6     difference signal based on a signal quality of the sum and difference signals.

1           26. The device of claim 25 wherein the hybrid has a first antenna port to  
2 couple with a first of the antennas, a second antenna port to couple with a second  
3 of the antennas, and a first and a second switch port to provide respectively the  
4 sum signal and the difference signal,

5           wherein the hybrid has a reactive power-divider associated with the ports  
6 and is to provide a predetermined phase difference between the ports,

7           wherein a signal path between the reactive power-dividers comprise 90-  
8 degree bends to reduce a distance between the reactive power-dividers to less  
9 than a distance associated with the predetermined phase difference, and

10          wherein the switching circuitry further comprises logic circuitry to  
11 compare a packet error rate between the sum and difference signals and to select  
12 one of the signals having lower packet error rate.

1           27. The device of claim 25 wherein the signals comprise orthogonal  
2 frequency-division multiplexed signals comprising a plurality of symbol-  
3 modulated subcarriers in a predetermined frequency spectrum, the predetermined  
4 frequency spectrum comprising either a 5 GHz frequency spectrum or a 2.4 GHz  
5 frequency spectrum, and

6           wherein the device further comprises transceiver circuitry to measure the  
7 packet error rate of the sum and difference signals, and to receive the selected  
8 signal from the switching circuitry for subsequent demodulation.

1           28. An article comprising a storage medium having stored thereon  
2 instructions, that when executed by a computing platform, result in selecting  
3 between a sum signal and a difference signal based on a packet error rate of the  
4 signals, the sum signal and the difference signal being generated with a hybrid  
5 from a pair of antennas.

1           29. The article of claim 28 wherein the instructions, when further  
2 executed by the computing platform result in further selecting between the sum  
3 signal and the difference signal,

4           wherein the signals are generated by providing substantially a  
5 predetermined phase difference between at least some ports of the hybrid, and

6            wherein a signal path between reactive power-dividers associated with  
7   the ports comprises a plurality of 90-degree bends to reduce a distance between  
8   the reactive power-dividers to less than a distance associated with the  
9   predetermined phase difference.

1            30. The article of claim 29 wherein the instructions, when further  
2   executed by the computing platform result in:  
3            measuring the packet error rate of the sum signal and the difference  
4   signal;  
5            comparing the measured packet error rates; and  
6            demodulating the selected signal,  
7            wherein the signals comprise orthogonal frequency-division multiplexed  
8   signals comprising a plurality of symbol-modulated subcarriers in a  
9   predetermined frequency spectrum, the predetermined frequency spectrum  
10   comprising either a 5 GHz frequency spectrum or a 2.4 GHz frequency spectrum.